

carboxyl group, or an alkylsilyl or alkylsilylalkyl group having from 3 to 30 carbon atoms, and R's may be the same or different, and may be optionally bonded to each other to form a cyclic structure; a represents 0, 1 or 2; and n and m each represent an integer of at least 1.

14. (Amended) A method for producing olefin-styrene copolymers, which comprises polymerizing olefins and styrenes in the presence of the copolymerization catalyst of [any of above 1 to 13] claim 1.--

Claims 15-39 (New).

## DESCRIPTION

CATALYST FOR OLEFIN/STYRENE COPOLYMERIZATION, AND PROCESS FOR  
PRODUCING OLEFIN/STYRENE COPOLYMERTECHNICAL FIELD

The present invention relates to catalysts for copolymerization of olefins and styrenes, and to methods for producing olefin-styrene copolymers. Precisely, it relates to catalysts for olefin-styrene copolymerization comprising, as one component, a specific compound, and to inexpensive and efficient methods for producing olefin-styrene copolymers with the catalysts.

BACKGROUND ART

Recently, metallocene catalysts have been developed and used for olefinic polymer production, which comprise, as the catalyst component, a transition metal compound having a  $\pi$ -ligand bonded to the center metal element via a group.

To exhibit satisfactory activity, however, the catalysts of that type require a large amount of promoters such as aluminoxanes and the like. Therefore, they are problematic in that the total catalyst costs are inevitably high, and, in addition, the catalyst residue resulting from the promoter used often remains in the polymers produced thereby unfavorably coloring the polymers.

In that situation, techniques of using clay, clay minerals and the like along with the catalysts have been proposed so as to reduce the amount of the promoters to be used along with them (Japanese Patent Laid-Open Nos. 301917/1993, 136047/1994, 164510/1997, 009206/1989, etc.).

At present, however, even these techniques could not as yet provide catalysts having satisfactorily high activity.

The present invention is to provide catalysts for olefin-styrene copolymerization capable of efficiently and inexpensively producing olefin-styrene copolymers, and to provide methods for producing olefin-styrene copolymers.

#### DISCLOSURE OF THE INVENTION

We, the present inventors have assiduously studied so as to attain the object as above, and, as a result, have found that copolymerization catalysts containing, as one component, a specific compound have improved copolymerization activity and therefore the amount of the promoters such as oxygen-containing compounds and others to be used with them can be reduced. On the basis of this finding, we have completed the present invention.

The invention is to provide a catalyst for copolymerization of olefins and styrenes and a method for producing olefin-styrene copolymers, which are as follows:

1. A catalyst for copolymerization of olefins and styrenes,